

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

# PCT

To:

see form PCT/ISA/220

## WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/JP2004/010276

International filing date (day/month/year)  
13.07.2004

Priority date (day/month/year)  
30.07.2003

International Patent Classification (IPC) or both national classification and IPC  
B60L11/18, B60K6/04, H02J7/14

Applicant  
TOYOTA JIDOSHA KABUSHIKI KAISHA

### 1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

### 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

### 3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office - P.B. 5818 Patentlaan 2  
NL-2280 HV Rijswijk - Pays Bas  
Tel. +31 70 340 - 2040 Tx: 31 651 epo nl  
Fax: +31 70 340 - 3016

Authorized Officer

Bufacchi, B

Telephone No. +31 70 340-3429



BEST AVAILABLE COPY

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/JP2004/010276

---

**Box No. I Basis of the opinion**

---

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/JP2004/010276

---

**Box No. II Priority**

---

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

---

**Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

---

1. Statement

Novelty (N)	Yes: Claims	1-23
	No: Claims	
Inventive step (IS)	Yes: Claims	2-5,7-10,15,17,18,22-23
	No: Claims	1,6,11-14,16,19-21
Industrial applicability (IA)	Yes: Claims	1-23
	No: Claims	

2. Citations and explanations

**see separate sheet**

---

**Box No. VI Certain documents cited**

---

1. Certain published documents (Rules 43*bis*.1 and 70.10)

and /or

2. Non-written disclosures (Rules 43*bis*.1 and 70.9)

**see form 210**

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/JP2004/010276

---

---

**Box No. VII    Certain defects in the International application**

---

The following defects in the form or contents of the international application have been noted:

**see separate sheet**

**Re Item V.**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1 The following documents are referred to in this communication:

D1 : EP-A-1 318 285 (TOYOTA MOTOR CO LTD) 11 June 2003  
D2 : EP 0 829 386 A (TOYOTA MOTOR CO LTD) 18 March 1998  
D3 : US 2002/094908 A1 (HARADA CHIAKI ET AL) 18 July 2002  
D4 : EP 0 909 675 A (TOYOTA MOTOR CO LTD) 21 April 1999  
D5 : EP 1 245 422 A (VISTEON GLOBAL TECH INC) 2 October 2002

2. **The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1, 14 and 21 is not inventive in the sense of Article 33(3) PCT.**

Claims 14 contains all the features of claim 1 (it covers an automobile including the apparatus of claim 1) and is therefore a dependent claim. Claim 21 lists only the method steps also included in claim 1. The reasoning below therefore holds for all these claims.

Document D4 discloses (the references in parenthesis applying to this document):

A power output apparatus that outputs power to a drive shaft, said power output apparatus comprising;  
an internal combustion engine;  
an electric power-mechanical power input-output unit that is linked with an output shaft of said internal combustion engine and with the drive shaft to maintain or vary a driving state of said internal combustion engine and to output at least part of power from said internal combustion engine to the drive shaft through inputs and outputs of electric power and mechanical power (Fig. 1);  
a motor (26, 28) that is capable of inputting and outputting power from and to the drive shaft;  
a secondary battery (50) that is capable of supplying and receiving electric power to and from said electric power-mechanical power input-output unit and said motor;  
an input restriction setting module that sets an input

restriction of said secondary battery (claim 1);  
a charge-discharge electric power measurement module that measures a charge-discharge electric power used to charge said secondary battery or obtained by discharging said secondary battery (claim 3; Figs 3-5);

a power demand setting module that sets a power demand required to the drive shaft, in response to an operator's manipulation (44);

**a driving state varying mode changeover module that selects a driving state varying mode to vary the driving state of said internal combustion engine**, based on the charge-discharge electric power measured by said charge-discharge electric power measurement module and the input restriction set by said input restriction setting module (Para. 0018, 0019),

a controller that controls said internal combustion engine (10), said electric power-mechanical power input-output unit and said motor to ensure a variation in driving state of said internal combustion engine in the selected driving state varying mode and output of a power corresponding to the setting of the power demand to the drive shaft (para 0018, 0019).

The subject-matter of claims 1, 14 and 21 differs from this known apparatus and method only by the inclusion of feature "I" below:

- I the driving state varying mode changeover module selects a driving state varying mode to vary the driving state of said internal combustion engine **in response to setting of an abruptly decreasing power demand** by said power demand setting module.

D4 discusses the same problem with which the application is concerned, namely that the battery needs to be charged and discharged according to certain limitations under all driving conditions, including decreasing power demand or braking. While teaching that overcharging must be avoided, it does not disclose the more specific problem of limiting overcharging in response to abruptly decreasing power demand.

This problem is, however, well known to a person skilled in the art. See for example D1, Para 0077 (which discloses both the problem and claimed solution); D2, claim 22 and D3, para. 0105.

Document D5 discloses the solution embodied in feature "I" of claims 1, 14 and 21, namely that the driving state varying mode changeover module selects a driving state varying mode to vary the driving state of said internal combustion engine **in response to setting of an abruptly decreasing power demand** by said power demand setting module - see eg. D5, claims 23-26. See also D1, para 0077.

Since both the problem and claimed solution are known, the subject matter of these claims is obvious in the light of D4 combined with D5 or D1, as well as in the light of D1, D2 or D3, each taken individually.

**3. Dependent claims 6, 11-13, 16, 19, 20 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT).**

These features are all disclosed or suggested by the available prior art.

**4. The combination of the features of dependent claims 2-5, 7-10, 15, 17, 18, 22-23 are neither known from nor rendered obvious by the available prior art, since it does not suggest the special engine control steps embodied in these claims.**

### **Re Item VII**

#### **Certain defects in the international application**

Claim 14 comprises all the features of claim 1 and is therefore not appropriately formulated as a claim dependent on the latter (Rule 6.4 PCT).

The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).